FAA | AVIATION NEWS

SEPTEMBER 1964

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FAA | AVIATION NEWS

F E D E R A L A V I A T I O N A G E N C Y

VOL. 3, NO. 5 SEPTEMBER 1964

COVER

Touring North America, the Hawker Siddeley DH-125, with FAA certification expected soon, was flown last month by Administrator Halaby.
See page 11.

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Careful readings were taken by scientific recording devices and instruments located in test houses.

Strain gauges were set in rafters and ceilings.

FIRST SONIC BOOM TEST IS COMPLETED IN OKLAHOMA CITY

The study of public acceptability of sonic boom in the Oklahoma City area has been completed.

In all, 1,253 booms were generated over Oklahoma City in the program. They were conducted to help determine public reaction to booms at the levels now predicted for United States and overseas-manufactured supersonic transports expected to be in airline service in the 1970s. The process of analyzing and evaluating this material is now under way. The boom study, an essential element of the nation's supersonic transport development program, ran from Feb. 3 through July 30.

FAA Administrator N. E. Halaby, in an address in Oklahoma City last month following conclusion of the boom study period, commended the citizens for their part in a program aimed at "trying to help our fellow Americans to build a safe, sound transport that will serve the world. . . ."

Administrator Halaby presented citations to the people, mayor, and city council of Oklahoma City, the Governor of Oklahoma, and the city's Chamber of Commerce for "contributing significantly to the future of aviation in the United States" for participation and support of the boom study.

Preliminary data gathered in the study, presented by Gordon M. Bain, Deputy Administrator for Supersonic Transport Development, in an address following Halaby, included the following:

- As a result of meteorological factors, "there was not a uniform distribution of the overpressure pattern." Sometimes the boom overpressures were of greater magnitude 10 miles from the plane's flight track than under the track. Most of the boom levels were recorded at predicted levels, but on some occasions they were increased or diminished.
- During the test period, a total of 12,588 calls or letters were received by a complaint center operated in Oklahoma City. This figure represents approximately two per cent of the population included in the program.
- A total of 2,170 formal damage claims were filed during the 26-week program. Following investigation, 1,732 were denied. Claims totaling $8,608 have been approved for 163 claimants, or an average of $52.81 per claim. A large proportion of these were for cracked plaster or glass.
- No damage from booms was found in 11 test houses instrumented or kept under surveillance in the study.
- Findings in the public reaction and structural facets of the Oklahoma City study will be made public following the analysis and evaluation of more than 100,000 statistical recordings.

Deputy Administrator Bain said upon completion of the study:

"Sonic boom presents the most imposing single challenge to design and operation of a supersonic transport plane. The people of Oklahoma City have been helping explore this challenge as, in effect, major participants in the nation's supersonic transport development program.

"While the Oklahoma City study is not the end of the research which must be carried on with respect to public acceptance of the sonic boom phenomenon, it is my personal opinion that it will be a major element in our evaluation of the supersonic transport. I sincerely feel that in the years ahead the citizens of Oklahoma City will take pride in their participation and contribution to the national supersonic transport development program.

"Appreciation for an important and difficult contribution must also go to members of the Government team. Among the foremost of these must be numbered the competent and skilled Air Force pilots, who flew their supersonic missions over Oklahoma City with such care and precision.

"The personnel of the FAA Aeronautical Center, Oklahoma City, though in no way responsible for the nationally-based supersonic transport program and its diverse requirements, performed admirably in double duty that was required to do their own jobs and meet demands made of them in this study.

"Nor should we overlook the notable technical support provided throughout by the National Aeronautics and Space Administration."

The National Academy of Sciences acted in an advisory capacity in the latter stages of the Oklahoma City study, as it is expected to do in connection with future sonic boom research.

Air Force supersonic F-101, F-104, F-106, and B-59 aircraft generated the daily booms.

Two airfame and two engine companies, selected in an initial design competition earlier this year (July *FAA Aviation News*) are currently conducting supersonic transport design work under FAA contracts.

WNA RUNWAYS RESURFACED; PERSONNEL LAUDED

With the re-opening of a newly-resurfaced north-south instrument runway, Washington National Airport has returned to normal operation and various FAA personnel have been commended by FAA Administrator N. E. Halaby for a job "well done."

Construction work closed WNA's 6,870-foot north-south runway from May 1 to July 27. This work included installation of touchdown zone and center line lighting systems as well as resurfacing. The north-south runway normally handles 60 to 65 per cent of all air traffic at the airport.

National's two other runways, both of which intersect the north-south strip, also were shut down at different times during the three-month construction period to permit resurfacing of the intersections. The 5,212-foot northwest-southeast runway was closed from May 15 to May 30 and the 4,724-foot northeast-southwest runway was closed from June 1 to July 1.

FAA received many favorable comments from airline and private flyers concerning the performance of the air traffic controllers during the construction period.

In a letter to Oscar Bakke, director of the Eastern Region, Administrator Halaby praised the controllers and said it had been "gratifying to note that the safe, efficient flow of traffic was maintained at WNA during this trying time."

"We realize," he added, "that a single runway operation at a high density airport poses many unique problems for air traffic control personnel."

The Administrator also praised the engineering division of the Bureau of National Capital Airports and the operations division of Washington National Airport for doing an "outstanding" job. In a letter to the Bureau's director, G. Ward Hobbs, Halaby recognized "the tasks involved were difficult indeed."

Despite the availability of only one runway during most of May and June, airline operations declined less than three per cent and total aircraft operations less than five per cent from May and June of 1963. Airline operations dropped from 35,597 to 34,605 and total aircraft operations from 51,477 to 48,915.

Airline passengers, on the other hand, increased almost 11 per cent this May over May 1963, rising from 462,804 to 513,544. Passenger totals for June are not complete.

National Airport is operated by the FAA as is Dulles International Airport in nearby Chantilly, Va., which showed a corresponding increase in traffic during the close-down period at WNA. Last year, National was the fourth busiest airline airport in the United States and ranked sixth in total aircraft operations.

Test Program Is Joint Effort

For the first time, pilots from the FAA, the Air Force and an aircraft manufacturing company have flown an aircraft roundtrip over the United States in a test program. Part of the FAA certification procedure, the C-141 flights were piloted by Harlan Armitage, Lockheed-Georgia Co.; Frank E. McGowan, FAA's Southern Region, and Maj. T. D. Benefield, Edwards Air Force Base, Calif.

FAA Buys Temperature Sensory Equipment to Study Turbulence

A $92,486 contract to buy 10 devices for detecting and recording temperature variation in air masses, which may be associated with clear air turbulence, has been awarded by the Federal Aviation Agency to Litton Systems, Inc., Woodland Hills, Calif.

The equipment will be installed in jet transports operated by U. S. air carriers to be selected with the cooperation of the Air Transport Association. Flights will be chosen on the basis of routes flown between 29,000 and 41,000 feet. These are altitudes where clear air turbulence is most often encountered over the North American continent.

Preliminary research by the U. S. Weather Bureau and Eastern Airlines has indicated a relationship between temperature change and clear air turbulence. The possibility of developing an air temperature sensor which would detect variations as much as two miles ahead of the aircraft's position has encouraged the FAA to seek more data on possible relationship between temperature changes and turbulence.

While clear air turbulence is a rarely encountered phenomenon, the FAA and other concerned agencies are actively seeking more scientific data. Studies are under way to provide pilots with effective ways of coping with rough air should it be unexpectedly encountered, as well to develop warning devices.

PARACHUTE REGS AMENDED

Parachutes are no longer required during certain acrobatic flights under a new FAR amendment (FAR 91.71c) which went into effect on Aug. 27.

- During flight tests for pilot certification or rating.
- For acrobatic maneuvers, such as spins, which are required by regulation for any certificate and rating when given as part of flight instruction by a certificated flight instructor or by an airline transport pilot instructing under the provisions of FAR 61.163.

Previously the regulation prohibited intentional acrobatic flight in an aircraft carrying a person other than a crew member unless all occupants were equipped with approved parachutes. Therefore, when a student pilot, who was interpreted as being a passenger, was taking acrobatic instruction, both the student and the flight instructor were required to wear a parachute.

DIRECTOR RETIRES

After serving 36 years with the FAA and its predecessors, John M. Beardslee, director of the FAA's Central Region with headquarters at Kansas City, Mo., retired from government service this month. Another career employee, Edward C. Marsh, who has served as deputy director of FAA's Western Region, will succeed him.

Controlled Airspace in Terminal Areas Shifted to Region Control

Responsibility for designating controlled airspace in terminal areas has been transferred from Federal Aviation Agency's Washington headquarters to its regional offices.

The change—effective immediately—will enable FAA to speed handling of terminal airspace cases. It also will permit these cases to be decided by the Agency officials most familiar with geographic areas involved.

FAA proposed the change in a Proposed Rule Making Notice 64-9, which was circulated for industry and public comment last February.

An additional proposal to give the regions authority to designate restricted areas and other special use airspace has been dropped as a result of comments received. The Agency now believes this function should be retained in Washington because these matters require close coordination with the Department of Defense and the national headquarters of civil user organizations.

FAA headquarters also will continue to handle airspace assignments for en route purposes. Regional directors, however, will be authorized to make minor revisions in Federal airways when this action is associated with a terminal airspace case and the changes are approved by the Washington office.

FIRST 'SHAREHOLDERS' MEETING SLATED SEPT. 30

Many of the nation's top aviation executives will gather in Washington this month to participate in the FAA's first "airspace shareholders" meeting.

Conducted by Administrator N. E. Halaby, the two-day meeting beginning Sept. 30 will bring together some 100 persons who are responsible for determining policy on all phases of aviation.

"We will inform important segments of American aviation of the present status and future plans of the National Aviation System," said Mr. Halaby. "We want to elicit suggestions and comments from the users of the system regarding its status and plans for the future."

Among the guests, representing the Federal Government, will be the Civil Aeronautics Board, the National Aeronautics and Space Administration, and the Departments of Defense and Commerce.

Joining with them will be policy level executives from the airlines; airframe, powerplant and avionics manufacturers; leading aviation trade associations; and aviation trade unions.

Aviation Medical Examiners' Seminars Announced

Seminars for aviation medical examiners (AME's) which will be held at various universities and medical institutions during fiscal year 1965 have been announced by the FAA Office of Aviation Medicine.

The three-day seminars are devoted to lectures and discussions of advancements in aviation medicine affecting airmen and the FAA airmen medical certification system.

AME's will be invited to attend the seminars by the Aeromedical Certification Division, Oklahoma City. Advanced courses will be limited to AME's who have previously attended a general seminar.

The seminar schedule is:

Sept. 16-18, Ohio State University (ADV)
Sept. 30-Oct. 2, University of Arkansas
Oct. 28-30, Mayo Clinic (ADV)
Nov. 18-20, Harvard University (ADV)
Dec. 2-4, Georgetown University (ADV)
Jan. 13-15, University of Southern California (Los Angeles)
Feb. 3-5, University of California (ADV) (San Francisco)
March 10-12, University of Florida
April 7-9, University of Illinois
May 17-19, Jefferson Medical School (Philadelphia)
June 23-25, Emory University (ADV)
(ADV)—*Denotes advanced seminars.*

Foreign Pilots View Experimental Planes

West European pilots touring the United States in Piper Cherokees *(August* Aviation News*) arranged their itinerary so they could observe the 12th annual Experimental Aircraft Association meeting in Rockford, Ill., Aug. 4-9. The group arrived on the busiest day, Aug. 8, when the Greater Rockford Airport accommodated 2,200 aircraft. FAA tower personnel handled 21,612 operations during the event, the largest in EAA's history. It attracted 2,000 members.*

LEVEL OF STANDARD ALTIMETER SETTING LOWERED

The base altitude for the standard altimeter setting will be lowered from 24,000 to 18,000 feet under a new rule effective 0001 Eastern Standard Time, Sept. 17.

All aircraft operating at or above 18,000 feet mean sea level (MSL) will be required to use the standard altimeter setting of 29.92 (inches of mercury). Provision is made for determining the correct cruising and minimum altitudes.

Aircraft operating below 18,000 feet MSL will continue to use corrected altimeter settings obtained from an appropriate ground station along or near the route of flight.

Use of the standard altimeter setting increases altimeter uniformity between aircraft flying the jet routes. It also reduces frequent changing of altimeter settings which in turn minimizes the chance of errors.

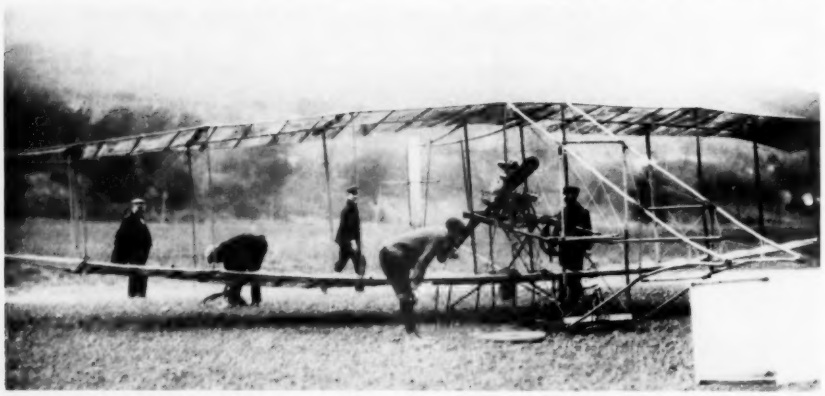
The change in the base altitude for the standard altimeter setting coincides with the revision of the airway route structure from the present three-layer system to a simplified two-layer system on Sept. 17.

The two-layer airway route structure will provide airways up to 18,000 feet, and jet routes between 18,000 feet and 45,000 feet. The airspace above 45,000 feet will be available for random operations with no established airways or routes.

The present three-layer system consists of low altitude airways up to 14,500 feet, intermediate altitude airways between 14,500 feet and 24,000 feet, and high altitude jet routes above 24,000 feet. It was established in April 1961.

The change in the base altitude for the standard altimeter setting was outlined in a Notice of Proposed Rule Making (Notice 64-16), which was circulated for comment last March.

MILESTONES IN AVIATION



Experiencing the greatest public acclaim of any airplane of its day and far outstripping the fame of the earlier Wright brothers' flights, the *June Bug*, designed under the direction of Glenn H. Curtiss, keynoted a long line of Curtiss accomplishments that spurred America's budding aviation industry.

Flown for the first time in June 1908, the *June Bug* was equipped with an 8-cylinder, air-cooled engine and wing-tip ailerons. On July 4, 1908, before several thousand people in Hammondsport, N. Y., Curtiss won the *Scientific American* magazine's prize for the first public flight in America over one kilometer. On this flight, he flew approximately 6,000 feet at 39 mph in one minute and 43 seconds.

Later, after Orville Wright heard that Curtiss was using ailerons on his airplane, he alleged infringement of the Wright warping patents. After a long and bitter legal battle with Curtiss and others, the courts decided in favor of the Wrights. This led to Curtiss's development of a between-wing aileron.

The *June Bug* was one of the airplanes produced by a private research group, the Aerial Experiment Association, which was headed by Alexander Graham Bell. *(Smithsonian Institution photo.)*

December 1964 Is Proclaimed International Aviation Month

December 1964 has been designated United States International Aviation Month in a proclamation signed recently by President Lyndon B. Johnson. The month marks 20 years of international cooperation in civil aviation.

On Dec. 7, 1944, 52 nations met in Chicago at the invitation of the United States and subsequently drafted an international agreement, the Convention of International Civil Aviation. As a result of the Chicago Convention, as it is often called, the International Civil Aviation Organization (ICAO) was established on April 4, 1947, with headquarters in Montreal.

Chester C. Spurgeon, of the FAA, heads a committee on arrangements representing five U. S. Government agencies making up the Interagency Group of International Aviation (IGIA) to develop national programs for the December 1964 observances.

Other members of the committee represent the Department of State, the Department of Defense, and the Civil Aeronautics Board.

Central Computer Complex Order Initiates National ATC System

A central computer complex which will serve as backbone of the planned semi-automatic air traffic control system, has been ordered by the FAA from the International Business Machine Corp., Rockville, Md., for $3,091,322.

The purchase represents a milestone in the new system which is known as Stage A of the National Airspace System.

The FAA will incorporate the computer complex into an engineering model of the new air traffic control system—the first of its kind—at the Agency's National Aviation Facilities Experimental Center located at Atlantic City, N. J., during late summer or fall of 1965.

In the new system, aircraft position will be displayed clearly and accurately on radar scopes along with an automatically presented identification tag. The "tag," called alphanumerics, will provide aircraft identity and current data such as altitude, type of aircraft, and other information needed by the controller in providing for the safe, orderly, and expeditious flow of air traffic.

Plans are being formulated for the implementation of the first operational field installation of this semi-automatic air traffic control system at an operational facility in 1966.

AGENCY PROPOSES MODERNIZATION OF FLIGHT SERVICE STATION SYSTEM

Proposed plans to modernize FAA's flight service station system were announced by Administrator N. E. Halaby during budget testimony made before Senate and House subcommittees earlier this year and released last month.

The proposed FSS plan would result in a savings of $3 million a year and would reduce flight service station personnel by 500 to 600 people. Adjustments in personnel would be carried out over a three-year period with qualified employees given opportunities for reassignment and transfer to other duties within FAA, while some losses would be taken up by normal personnel attrition.

There would be no reduction in essential services or impairment of flight safety.

Under the proposal, full air-ground communications would be provided over the contiguous 48 states with a network of 154 flight service stations and 67 combined station/towers.

These stations would become the hard core of the system, operating continuously, seven days a week, 24-hours a day, and would handle all the present en route navigation, communications and terminal services. The flight service stations provide basic en route services to VFR aircraft which include air-ground communications, weather communications, monitoring facilities, pilot briefing, military flight service, handling flight plans, direction finding and flight assists.

The present system requires 297 stations and 61 combined S/Ts. FAA would continue to provide services at 137 locations where FSSs will be discontinued, using two new types of terminal facilities — a manned facility called MANICOM and an unmanned facility known as Airport Information Desk (AID). Current weather data and other information necessary for safe flight planning would be available at both facilities.

MANICOM would be staffed during the hours of greatest activity by one or two FAA flight service specialists, and would be linked to the nearest hard core flight service station. It would have weather observation and weather teletypes, carry on radio contact with local aircraft and have a supply of flight manuals, guides and flight plan forms. In addition, the MANICOM flight service specialists would take weather observations, provide airport advisory service, conduct pilot briefings, accept and close VFR flight plans, and perform other terminal duties now performed by existing flight service stations.

A pilot using an AID facility would get basic local weather information and detailed en route and destination weather information from the teletype and from the nearest flight service station by direct telephone line. He would also be able to file or close his VFR flight plans on the direct line to the FSS.

The two new facilities, MANICOM and AID, are to be field tested to determine the best method of handling terminal services at each of the 137 proposed locations. The tests will be conducted for three to six months at selected airport locations around the country. MANICOM tests will be made at some present FSS locations and AID tests will be run at locations where no service now exists. The program will not be implemented until after June 30, 1965.

Locations of the hard core flight service stations and combined station towers are:

Alabama—Birmingham; Dothan; Mobile; Montgomery; Muscle Shoals; **Arizona**—Phoenix; Prescott; Tucson; **Arkansas**—Pine Bluff; Texarkana; **California** — Arcata; Bakersfield; Blythe; Daggett; Fresno; Los Angeles; Oakland; Paso Robles; Red Bluff; Sacramento; San Diego; Santa Barbara; **Colorado** — Denver; Grand Junction*; Trinidad; **Connecticut** — Windsor Locks; **District of Columbia**—Washington; **Florida**—Crestview; Ft. Meyers; Gainesville; Jacksonville; Key West*; Miami; Orlando; Tallahassee; Tampa; Vero Beach; **Georgia**—Albany; Atlanta; Savannah; **Idaho**—Boise; Burley; Idaho Falls*; **Illinois** — Joliet; Quincy; **Indiana**—Indianapolis; South Bend; **Iowa**—Des Moines; Mason City; **Kansas**—Garden City; Goodland; Salina; Wichita; **Kentucky** — Louisville; **Louisiana** — Alexandria; New Orleans; **Maine** — Augusta; Houlton; **Maryland**—Salisbury; **Massachusetts**—Boston; Nantucket*; **Michigan**—Detroit; Marquette; Saginaw; Traverse City; **Minnesota**—Alexandria; Hibbing; Minneapolis; **Mississippi** — Greenwood; Jackson; **Missouri** — Cape Girardeau; Columbia; Kansas City; Springfield; St. Louis; **Montana**—Billings; Butte; Great Falls; Miles City; Missoula*; **Nebraska**—Grand Island; Lincoln; North Platte; Scottsbluff; **Nevada**—Elko; Las Vegas; Lovelock; **New Jersey**—Teterboro; **New Mexico**—Albuquerque; Farmington; Roswell; Truth or Consequences; Tucumcari; **New York**—Albany; Buffalo; Islip; Massena; **North Carolina**—Hickory; New Bern; Raleigh; **North Dakota**—Dickinson; Grand Forks; Minot; **Ohio**—Cincinnati; Cleveland; Columbus; Findlay; **Oklahoma** — Gage, McAlester; Oklahoma City; Tulsa; **Orgeon**—North Bend; Portland; **Pennsylvania** — Altoona; Bradford, Harrisburg; Philadelphia; Pittsburgh; **South Carolina** — Charleston; Greer; Florence; **South Dakota**—Huron; Pierre; Rapid City; **Tennessee**—Crossville; Knoxville; Memphis; Nashville; **Texas**—Abilene; Alice; Amarillo; Austin; Dallas; El Paso; Houston; Lufkin; McAllen; San Antonio; Wichita Falls; Wink; **Utah**—Cedar City; Hanksville; Salt Lake City; **Vermont**—Montpelier; **Virginia**—Charlottesville; Newport News; Roanoke; **Washington**—Bellingham; Seattle; Spokane; Walla Walla; Wenatchee; **West Virginia**—Charleston Morgantown; **Wisconsin**—Green Bay; LaCrosse; Milwaukee; **Wyoming**—Casper*; Rock Springs; Worland.

* Combined Station/Towers

Stations where MANICOM and AID will be provided are:

Alabama—Anniston; Tuscaloosa; **Arizona**—Douglas; Yuma; **Arkansas**—El Dorado; Fayetteville; Harrison; Walnut Ridge; **California**—Crescent City; Imperial; Marysville; Montague; Needles; Palmdale; Salinas; Stockton; Thermal; Ukiah; **Colorado**—Akron; Eagle; LaJunta; **Florida**—Melbourne; Pensacola; **Georgia** — Alma; Brunswick; Macon; Valdosta; **Idaho** — Malad City; Mullan Pass; **Illinois**—Rockford; Vandalia; **Indiana**—Fort Wayne; Lafayette; Terre Haute; **Iowa**—Burlington; Cedar Rapids; Ottumwa; **Kansas**—Chanute; Dodge City; Emporia; Hill City; Manhattan; Russell; **Kentucky**—Bowling Green; London; Paducah; **Louisiana**—Lafayette; Lake Charles; Monroe; **Maine**—Bangor (Old Town); Millinocket; **Michigan**—Houghton; Jackson; Lansing; Pellston; Sault Ste. Marie; **Minnesota**—Redwood Falls; Rochester; **Mississippi** — McComb; Meridian; **Missouri**—Joplin; Kirksville; Vichy; **Montana**—Bozeman; Cut Bank; Dillon; Lewistown; Livingston; **Nebraska** — Chardron; Imperial; Omaha; Sidney; **Nevada**—Ely; Tonapah; **New Hampshire**—Concord; Lebanon; **New Jersey**—Millville; **New Mexico**—Carlsbad; Deming; Grants; Las Vegas; Zuni; **New York**—Elmira; Glen Falls; Poughkeepsie; Utica; Watertown; **North Carolina**—Elizabeth City; Rocky Mount; **North Dakota**—Jamestown; **Ohio** — Dayton; Youngstown; Zanesville; **Oklahoma**—Ardmore; Hobart; Ponca City; **Oregon**—Baker; Redmond; The Dalles; **Pennsylvania**—DuBois; Erie; Philipsburg; Wilkes Barre; Williamsport; **South Carolina**—Anderson; Myrtle Beach; **South Dakota**—Aberdeen; Watertown; **Tennessee**—Dyersburg; Jackson; **Texas**—Childress; College Station; Cotulla; Dalhart; Fort Worth; Galveston; Junction; Midland; Mineral Wells; Palacios; **Utah**—Delta; **Virginia**—Danville; Richmond; **Washington**—Ephrata; Hoquiam; Toledo; **West Virginia**—Bluefield; Elkins; Huntington; Martinsburg; Parkersburg; **Wisconsin**—Eau Claire; Lone Rock; Wausau; **Wyoming**—Laramie; Rawlins; Sheridan.

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The *Wren 460,* although only recently certificated by the FAA, is quickly making a place for itself in the airspace as an "acre airport airplane." It has already flown the Atlantic and half-way around the world where it is being used in Laos, New Guinea and Thailand by private owners operating out of short jungle and mountain air strips.

The four-place, high-wing *Wren,* with a modified Cessna 182 airframe, is a newly-designed STOL (short take-off and landing) aircraft. It derives its slow flight abilities from aerodynamic devices applied to an otherwise conventional airplane.

Without changing the wing area or engine, the new *Wren 460* uses four aerodynamic devices to gain STOL performance—full-span, double-slotted flaps which are used to increase lift thus permitting slow flight; an augmented wing leading edge giving the airplane a more docile stall characteristic; movable spoilers atop the wing which are linked to the ailerons to improve roll and yaw control during slow flight; and a nose-mounted set of elevator controls linked to the rear elevators which act on the slipstream of the propeller and give the airplane increased pitch control in slow flight.

The innovations added to the airframe give the *Wren* a lower controlled minimum flight speed permitting landing and take-offs in 300 feet at gross loads and zero wind conditions. It cruises at more than 150 mph and has a range of more than 1,000 miles.

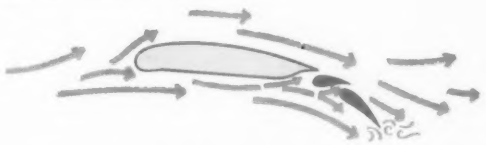
Although the Cessna 182 was certificated in 1956, engineers had to make new studies because of the *Wren 460's* new wing design.

Above—FAA's SW Region Director A. W. League, right, presents supplemental type certificate to Wren officials. Right—New Wrens are readied for flight; three are destined for Laos, New Guinea and Thailand.

lew STOL Aircraft Emerges rom Conventional Design

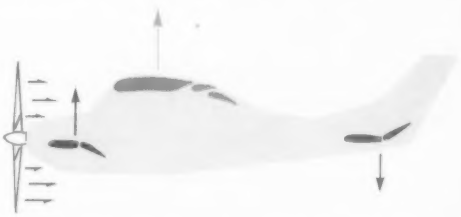
AERODYNAMIC FEATURES

Four principal devices give the **Wren 460** its short take-off and landing capability, as well as reduced speed. These include:

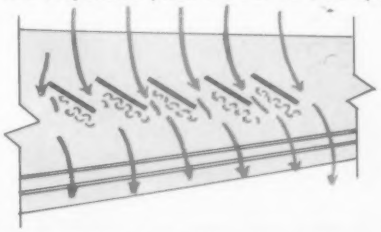


Full-span double-slotted flaps—The slots of the full-span double-slotted flaps direct the lower surface high-energy flow over the upper surface of the high lift flaps to delay flow separation thus reducing stall speeds. The outboard flap section also functions as ailerons. These "flaperon" surfaces remain effective at low speed, providing lateral control through the stall speed range.

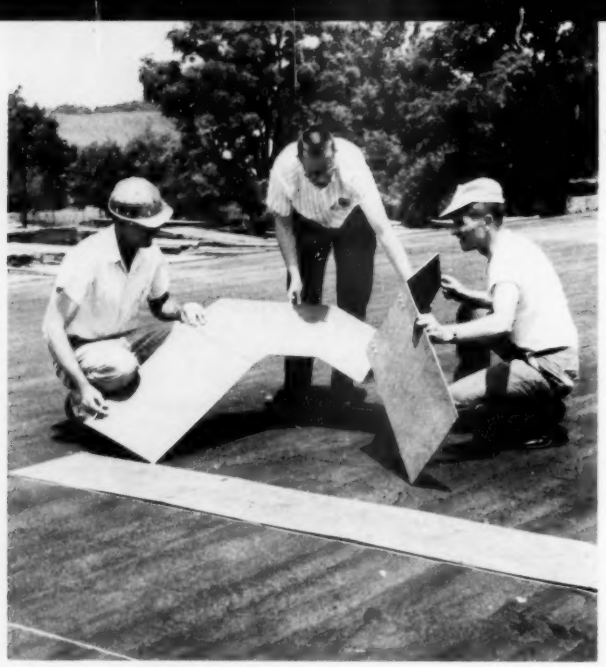
Dropped wing leading edge—The augmented leading edge radius retains the airflow in the leading edge region, allowing the stall-producing separation to initiate at the trailing edge. In a stall, if the wing angle of attack is reduced even slightly, the flow readily re-attaches to the surface, producing extremely docile stall characteristics.



Extra slow speed nose control system—The nose control surface is inter-connected with the tail elevators to augment the **Wren's** pitch control system. Its forward position utilizes the propeller blast and gives it a responsive pitch control at slow speeds.

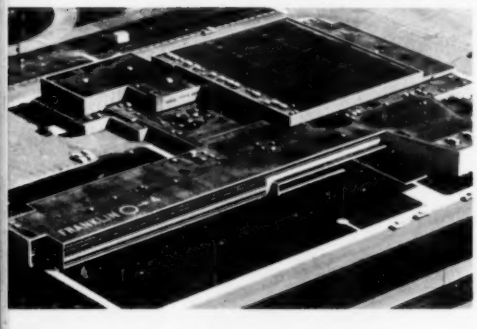


Aileron activated drag plate—Drag plates called "Wren's teeth" on the upper surface of the outboard wing panels work in conjunction with the aileron system. They rotate up to 60° into the airflow on the up-going aileron side only, precluding adverse aileron yaw at low speeds. At high speed the airflow holds the plates in a trail position.



Members of the controllers' association and the Indiana Jaycees set the templates in place and painted them bright yellow.

The O→4 symbol after Franklin indicates the distance and direction to the nearest airport.



O→4

SILENT SENTINELS

Celebrating its first year of operation this month, Operation Silent Sentinel, a volunteer air marker program in Indiana, can already look back at an impressive record.

Within the short span, the group has painted air markers on 32 rooftops in various Indiana cities.

Although many states have outstanding state-financed, perpetual air marking programs, a few states, including Indiana, have depended upon volunteer projects.

This operation, sponsored jointly by the Greater Indianapolis chapter, Air Traffic Control Association (ATCA); the Indiana chapter of the women's flying organization, the Ninety-Nines; and the Indiana Junior Chamber of Commerce, initiated the air marker program on Sept. 10, 1963, when they dedicated their first "Silent Sentinel" atop the Franklin Community High School in Franklin.

The Indiana Aeronautics Commission furnished the paint for the first 20 air markers. Subsequently, "penny-a-pound" fund-raising flights were conducted by the commercially-rated pilots of the Ninety-Nines, their husbands, flying club members, and other local pilots in Indianapolis, Muncie, Bloomington, Sheridan, Richmond, Elkhart, Fort Wayne, and Hobart.

The widely-publicized "penny-a-pound" flights proved so successful that many passengers had to be turned away at the scales. Since April, the Ninety-Nines have carried 4,803 passengers, many of whom made their first airplane ride.

Besides their fund raising, the women's flying group headed by Indiana chairman Mrs. Peggy Coulter of Muncie, has helped the volunteers make survey flights to locate suitable buildings in towns selected for air marking.

ATCA members Frank Marshall and Maurice L. Hasecuster, FAA air traffic controllers working on their own time, have been the leaders of the project. They have laid out every marker on the rooftops.

Using templates designed by Mrs. Blanche Noyes, FAA's air marking staff chief, characters designating the town or pointing to the nearest airport are drawn on rooftops.

The letters are made 10 feet long to permit easy identification by pilots flying at 3,000 feet.

Junior Chamber of Commerce members from numerous Indiana towns participate in the project by securing permission to use selected rooftops in their cities for the air markers and by providing the muscles needed to paint the markers with bright chrome yellow paint.

Across the state, radiating from Indianapolis, the volunteers have provided pilots with positive air markers to aid aerial navigation, indicating the name of the town or airport, or directing the flier to the nearest airstrip.

Before the group puts down the collective brush, the volunteers of Operation Silent Sentinel plans to mark at least 160 Indiana rooftops.

SAFETY FIRST

Using Proper Fuel

While many motorists may fill up at just any gasoline pump, this haphazard method could lead to trouble for the aviator.

Every aircraft engine has been designed to use a specific grade of aviation fuel for satisfactory performance and unless the manufacturer's recommendations are followed, damage to engines or power failure may result.

The manufacturer's recommendations regarding the minimum grade and the amount of fuel are generally listed in at least one of three places:

- In the *Aircraft Owner's Manual.*
- On a placard in the cockpit.
- Imprinted or painted (as required by FARs) on the airplane in the vicinity of the fuel tank filler caps. For example: "26 gallons capacity; 80/87 octane fuel only."

Using higher grades of fuel is acceptable when the specific grade is not available. However, continued use of higher grades is not recommended because such use may result in engine malfunctions caused by fouled spark plugs, sticking valves, etc. There is no engine power or fuel consumption advantage with higher grade fuels, and the cost is greater.

Although most gasoline pumps or fuel trucks are plainly marked indicating the type and grade of fuel, a pilot can determine whether he is receiving the proper grade by its color. Dyes have been added by the refinery for ready identification of the five grades of aviation gasoline most commonly used by pilots. These types include:

Red—80/87 octane
Blue—91/98 octane
Green—100/130 grade
Orange—108/135 grade
Purple—115/145 grade

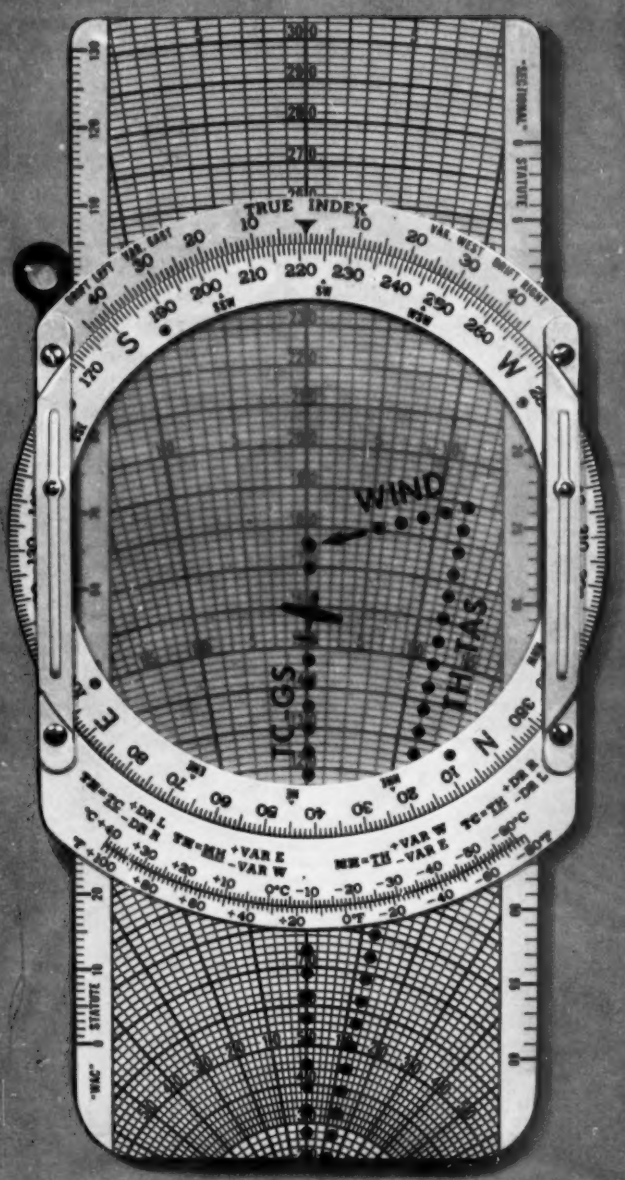
The gasoline numbers up to 100 refer to octane rating and those above 100 refer to performance numbers. The first number of each pair indicates the rating of lean mixture conditions (during cruising) and the second is the rating at rich mixture (climb and takeoff).

Occasionally, because octane ratings are similar, or for other reasons, pilots have been know to use automobile gasoline in their aircraft. This practice is inadvisable because the chemical composition of automobile gasoline is not designed for airplane engines. Automobile gasoline lacks the uniformity and characteristics of aviation fuel.

Two characteristics of automobile gasoline, its lower octane and its higher vapor pressure, could result in serious aircraft engine damage or costly maintenance problems. In flight, the higher vapor pressure could result in a vapor lock causing engine failure.

To assure safe operation, a pilot should consider the following refueling suggestions as part of his regular routine:

- Use only the grade of fuel recommended by the engine manufacturer.
- Keep the fuel tanks full to avoid condensation and contamination (*see back cover*).
- Keep tank vents free of obstructions.
- Periodically inspect and clean fuel tank outlet finger strainers and carburetor screens, and flush the carburetor bowl as recommended in the *Aircraft Owner's Manual.*



Alternate Wind Solution:

FLIGHT

This is the sixth of a series of articles on aerial navigation. Last month's installment described how to solve wind triangle problems on the wind side of the flight computer by another method.

An alternate method of solving wind triangle problems on the wind side of the flight computer is used by many general aviation pilots. Its handling simplicity, which requires no jiggling of the computer, and its pictorial presentation of the wind triangle make it a favorite of many pilots.

The wind triangle constructed using this solution is shown to the left. The lines of the wind triangle indicated on the computer are not actually drawn when using the computer but are indicated here to illustrate the wind triangle.

The wind triangle is represented by the following points:

1. Wind Dot. The wind dot or "X" is the point of intersection of the wind vector W and the true heading-true airspeed vector, TH-TAS. The wind arrow points toward the grommet.

The length of the wind line represents the wind speed in miles per hour.

2. The true course (TC) is represented by the center line of the grid. The ground speed (GS) is represented by the length of the TC-GS vector and is read under the grommet. In this case, it is 176 mph.

3. The wind correction angle is the angle between the true course and the true heading vector. In this case it is 12° right. The airplane shown, which lies on the true course line, has its longitudinal axis displaced to the right of the true course line (into the wind) an amount equal to the wind correction angle, or parallel to the true heading vector.

4. The true airspeed (TAS) is represented by the length of the TH-TAS vector. The true airspeed circle is placed under the wind dot or "X". In this case, it is 190 mph.

This wind triangle problem will be used most by the pilot during preflight while planning for a cross country flight.

Sample problem. A pilot measures the true course on the aeronautical chart and finds it to be 345°. He plans to cruise at a true airspeed of 140 mph. The winds aloft forecast obtained from the U. S. Weather Bureau for his proposed cruising altitude is 220° and 33 knots. What is the pilot's ground speed and true heading on this flight?

Solution on the computer.

1. Convert the wind from knots to mph (as described in the July edition of *FAA Aviation News*) on the computer. Using this method, we find that 33 knots equals 38 mph. *(See illustration #1.)*

COMPUTER

2. Slide the grid through the computer until one of the heavy horizontal lines lies under the center of the grommet. (The 170-mile grid line was chosen for this example).

3. Rotate the compass rose until the wind direction, 220°, appears under the true index. *(See illustration #2.)*

4. Measure *up* from the grommet, along the center line, a length equivalent to 38 miles. (*Note*—each horizontal line represents 2 miles.) At this point, place a pencil mark, a dot or an "X", which we will refer to as the wind dot.

5. Rotate the compass rose until the true course, 345°, appears under the true index. *(See illustration #3.)*

6. Slide the grid through the computer until the true airspeed 140 mph speed line lies directly under the wind dot.

7. Read the ground speed, 159 mph, under the grommet.

8. Find the wind correction angle by checking the number of degrees between the center line of the grid and the wind dot. In this case, it is 13°. (*Note*—Below the 150 mph line, each vertical line is equivalent to 1°.) Since the wind dot is to the left of the center line, the wind correction angle is 13° left.

9. Since the wind correction angle is 13° left, the true heading is found by substracting 13 from the true course. Thus, the true heading is 332° (345−13=332).

Note: After the wind correction angle is found, the true heading can be determined in another way. On the outer fixed scale (either side of the true index), each mark represents 1°. To find the true heading in the example above, count 13° to the left (since the wind correction angle was 13° left) and directly under this mark read the true heading, 332°, on the compass rose scale.

Try a few additional computer problems. Find the wind correction angle, the TH and GS of the following.

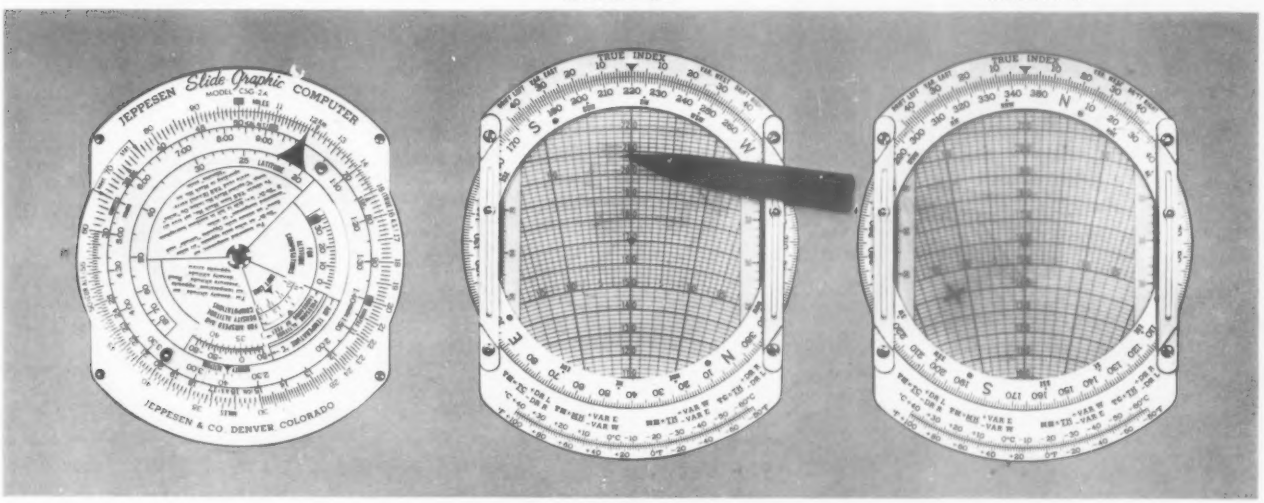
Problem 1: TAS 125 mph; TC 010°; Wind 150° at 35 mph.
Problem 2: TAS 122 mph; TC 267°; Wind 087° at 42 mph.
Problem 3: TAS 144 mph; TC 045°; Wind 315° at 13 knots.
Problem 4: TAS 137 mph; TC 140°; Wind 230° at 31 knots.
Problem 5: TAS 135 mph; TC 120°; Wind 060° at 20 knots.

Answers:

#1—WCA 10° Right; TH 020°; and GS 150 mph.
#2—WCA 0°; TH 267°; and GS 164 mph.
#3—WCA 6° Left; TH 309°; and GS 143 mph.
#4—WCA 15° Right; TH 155°; and GS 133 mph.
#5—WCA 9° Left; TH 111°; and GS 122 mph.

(Jeppesen Slide Graphic Computer—Courtesy Jeppesen & Co.)

Illustration #1 Illustration #2 Illustration #3



HALABY FLIES BUSINESS JETS

Administrator N. E. Halaby recently took his turn at the controls of three new business jets, the Jet Commander, the DH-125 and the LearJet, in line with his policy to fly planes personally before they go into regular service. Starting clockwise at the top left, Halaby prepares for his flight in the cockpit of the Jet Commander at Bethany, Okla., where he put the jet through its paces. The Jet Commander shown on takeoff is undergoing final preparation for an FAA type certification which is anticipated shortly. The British-made Hawker Siddeley deHavilland DH-125 (lower right and on the cover) is also awaiting certification. It was flown by Halaby from Dulles International Airport on Aug. 6. The LearJet, recently certificated by the FAA, shows sleek lines under a clouded sky.

Letters

FAA

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

● Pilot-Passenger Seating Regulations

What are the regulations regarding the seating of a private pilot and a passenger in a dual control airplane with side-by-side seating? In an airplane with tandem seating?

Does an aircraft owned by a flying club and used for student flight instruction require a 100-hour inspection?

Where can I find the requirements that an A&P mechanic must fulfill to obtain inspector authorization?

William J. Deitz
Rockwood, Tenn.

Federal Aviation Regulations *do not specify which seat the private pilot must occupy while carrying a passenger in an aircraft. The passenger can occupy either seat of a dual-controlled aircraft as long as all necessary flight controls are readily available to the pilot.*

An aircraft owned by a flying club is subject to periodic inspection but not to the additional 100-hour inspection requirement of Section 91.169 (b) of FAR Part 91 (new) unless it is operated for the carriage of a person (other than a crew member) for hire or to give flight instruction for hire. The use of the aircraft for instruction of club members is not considered "for hire" even though an instructor is paid for giving the instruction.

Inspection authorization requirements are listed in FAR Part 65, Section 65.91.

● Commercial Pilot Requirements

What document outlines the requirements for the commercial pilot certificate? What are the physical standards for the license? Also, where are the written examinations given and how long does the test take? What aviation schools offer ground and flight school training leading to a commercial pilot certificate?

James C. Schelinski
San Francisco

Federal Aviation Regulations *Part 61 contains requirements for commercial pilot certification. An FAA second class medical certificate is required for a commercial pilot operating an aircraft for hire, whether carrying passengers or cargo. Aviation schools are listed in FAA Advisory Circular No. 140-2, "List of Certificated Pilot Flight and Ground Schools." Free copies of AC-140-2 may be obtained by writing to the FAA, Attention: HQ-438, Washington, D. C., 20553.*

The written examination for a commercial pilot certificate may be taken at any time during normal office hours. The allotted time for this examination is five hours. An appointment may be made with an FAA inspector at any FAA general aviation district office for a flight test. A retest may be taken after waiting 30 days or after receiving a recommendation for such a retest from an appropriately rated flight instructor.

● Errata

Several errors appeared in the article entitled "Safety First—Landing an Airplane" in the July *FAA Aviation News*. A person with one million flight hours to his credit would have to spend 114 years in the cockpit!

Also, a speed 130 per cent above stalling is above the "gear-down" speed of most aircraft that I have flown. A landing at such speed would not contribute to a long life, in most cases. I believe the author intended to say: "The speed recommended for an approach is 130 per cent times stall speed. . .".

I. B. Kelly
Jackson, Miss.

Right in both cases. In the first instance, the sentence should have read: "Even captains of airline fleets with more than a million miles (*not* flight hours) *to their credit have found that mandatory check rides are very helpful."*

The recommended approach speed is 130 per cent times stall speed. If the stall speed for your aircraft is 60 mph, the recommended approach speed would be 130 per cent of 60 mph or 78 mph.

● Flying Schools

A group of businessmen have decided to start a flying school and we would appreciate a list of regulations and laws that govern both the initial establishment and continual operation of such an organization.

George C. Brooks
San Francisco

FAR Part 141, "Pilot Schools," prescribes the requirements for issuing FAA certificates and associated ratings to pilot schools and the general operating rules for the holders of these certificates and ratings.

For your information, the FARs do not prohibit the operation of a flying school which has not been certificated by the FAA. The operation and maintenance of aircraft used in all civil pilot training in the United States, however, must satisfy the requirements prescribed in FAR Part 91.

Statistical data concerning trends in private flying is included in the annual FAA Statistical Handbook of Aviation *which is available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, for 65 cents.*

● Medical Examinations

When does a student pilot need a medical certificate? How and where can he get his medical certificate?

Name Withheld

Before a student pilot can solo, he must obtain a third-class medical certificate. He can receive the certificate by passing a physical examination designed for pilots and administered by a doctor who is designated as an FAA aviation medical examiner (AME). There are approximately 5,500 doctors authorized by the FAA as AMEs. Senior Flight Surgeons at more than 500 military installations are also authorized to issue FAA medical certificates to personnel who are eligible for Department of Defense medical services. A directory, listing all AMEs by name and address, is available for reference at any FAA general aviation district office and at air traffic control facilities. Airport managers and most aviation operators can also supply this information.

● Kudos for United

I am deeply appreciative of the outstanding service and consideration which I received from United Airlines in a particularly painful and difficult experience on June 1. One of United Airline's agents, William Pryor, gave my aging mother, who had recently undergone major heart surgery, mouth-to-mouth resuscitation when she collapsed and apparently stopped breathing while at Washington National Airport. After restoring her breathing, Mr. Pryor and B. S. DeGroff, another United employee, accompanied us to George Washington Hospital. Both men were solicitous and helpful. Words really cannot express my gratitude and admiration for Mr. Pryor's presence of mind, courage and skill.

Marian C. Scheiner
Chevy Chase, Md.

● Aircraft Accident Investigations

Where can I obtain information regarding accidents caused by the wake turbulence of heavy jet aircraft upon small private aircraft?

William Singleton
Las Vegas

Although the FAA participates in the investigation of aircraft accidents, the Civil Aeronautics Board is charged with the determination of their causes. Information on the results of accident investigations should be requested from the CAB, Universal Building, 1825 Connecticut Ave., N.W., Washington, D. C. 20428.

FEDERAL AVIATION AGENCY
WASHINGTON, D. C. 20553

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Soon they'll carve an epitaph.